Social Engineering Program Responding to Growing Economies

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***Abstract*—Following the new trend in education, more focused in a global perspective COPEC - Science and Education Research Council is offering an MBA, on line, in Social Engineering for all Countries of CPLP - Portuguese Language Countries Community. The goal is to cover these countries engineers that also are seeking for opportunities, as the majority are countries of growing economy based on their very rich resources. The idea of an on line program is the possibility of reaching a broader audience and at the same time to enrich the experience of offering and implementing a program that can disseminate ideas and concepts that fits to the needs of the target audience. The Education Research Team of COPEC is convinced that Engineers with the proper knowledge and skills can perform in order to solve social problems once engineers are problem solvers.**

Keywords - online education; science and technology; research; public economy; population growth.

I. INTRODUCTION

The present world, full of challenges and crises of deep consequences to society as well to the environment, has a strong incidence in terms of decision-making in any field. It means that it is becoming more and more complex and difficult to take decisions due to the fact that the implications are felt in a faster way and in a larger community. For engineers, the decision process is even more complex once the implications have serious impact not only to the target customers but also to the society as a whole and to the environment. This is an aspect that shows the necessity for engineers to search for the acquisition of an ability to respond to social necessities having in mind the cultural aspects when developing a project [1].

The effects of this aspect in engineering formation implies a different approach providing the future engineers a notion about policy, ethics and social sciences, which are so important to prepare them to the future work market that will require the respect and promotion of society and environment as assets.

Most of social groups have ambiguous understanding about science and technology; some understand it as responsible for the environmental deterioration and the voracious capitalism and others as the ones responsible for the better quality of life with the improvement of health systems, agricultural production and other accomplishments. Both perceptions are not far from the reality. In any case, the impacts can be seen along the history and more recently with the sophistication of the so called "information society". This particular "information society" shows how strong the impact of any technology introduced in the society can be. Real time communication and brutal amount of information available have changed drastically how people relate; make business and study [2].

The proposal of COPEC - Science and Education Research Council for next five years is the offering of MBA by Distance Learning due to the new global education demand. The new programs will be delivered in Portuguese in a first moment, for all Countries of CPLP - Portuguese Language Countries Community. The idea is to cover these countries that also are seeking for opportunities, as the majority of them are growing

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and very rich Countries. The first group of programs is: MBA in Social Engineering and MBA in International Engineering Educator, both with International Recognition.

II. GLOBALIZATION AND SOCIAL COMPLEXITY

People share information and news through the net. There's a tornado in the other end of the world and you people get to know it almost instantly. People express opinions, feelings on their blogs and expose their lives in Facebook's. Today's globalization in terms of culture is blending the world because of technology of information.

For some reasons, the ancient globalization was more towards the physical domination by invasions, wars, trades etc. There are trades and wars today but the recent globalization is more focus on the information.

Industrial and financial globalization is increasing substantially and is creating new opportunities for both industrialized and developing countries. The largest impact has been on developing countries that now are able to attract foreign investors and foreign capital. This has led to both positive and negative effects for those countries.

In this scenario social groups are more complex and an engineering perspective in order to solve some issues is very important and necessary once the complexity due to the global world is pushing nations to pursue sustainable development. It will be possible if people take some attention to social problems.

III. SCIENCE, TECHNOLOGY AND ENGINEERING STATUS IN PRESENT WORLD

Many Countries in the world have recognized the importance of engineering in the world scenery. Therefore, they have been working to get the competitiveness of national goods and services by means of incentive to create projects of qualification of professionals through lifelong education, for example, and others. Leaderships, many representative groups, and agencies have been implementing programs to prepare engineers to increase the efficiency of the research system, experimental development, engineering, producing system and the market [3].

All these efforts have been having a kind of smooth effect once it is one of the most difficult and expensive programs of College level, which does not help with the inclusion policy. However, some Colleges have opted for a softer engineering program offering them in the evening. These programs are lighter, more focused in technical knowledge, and less focused in basic sciences. The students in general work all day and choose engineering programs because it is a way to be promoted at work [4].

A third degree diploma opens some doors. It means not only the possibility of earning more money but also to reach an upper status, socially speaking. It is a fact that, even being a lighter program for the students, it is very demanding and in general it takes them more than five years to complete. The diploma has the same value of a program that prepares engineers of conception. In a certain way, it helps the inclusion policy of education although the number of engineers has been decreasing considerably in the last 10 years [5].

IV. THE SOCIAL ENGINEERING PROGRAM – MBA OFFERED BY COPEC

In a global world, engineers should be aware of the responsibility to society as they contribute to its development. They need to be aware of not only environmental but also social impacts of the outcomes of projects. Looking closer to the training of engineers, there is still a prevalence of good technical formation without thinking of a broader knowledge achievement.

This broader formation is not a new idea; under Napoleon governance the French School of Engineering formed the "Engineer" that used to prepare the nation's leaders with a high profile of technical knowledge. After the globalization with all the discussions about introducing humanistic courses in engineering programs, the results have been humble. Nowadays it is difficult for engineers to address technology to solve social issues rather than to apply technology regardless social needs.

The design of a project now requires knowledge about the social as well as the environmental impacts, so engineers should be capable to learn how to work close to governments and communities, addressing the results of the projects to solve social problems or at least to prevent new ones.

In response to this necessity COPEC - Science and Education Research Council has developed a MBA in Social Engineering. It is an MBA program offered by distance that fulfills the urban demand of engineers to solve social problems that are outcomes of urbanization and environmental issues in cities.

Specialists in all areas of social science and engineering are extremely interesting to any enterprise of construction. It is a very wide field covering most national and international construction industry. There is also an increased demand for consultants with specialist knowledge in public economic system, scientific writing, venture capital and marketing, expertise for governmental bodies, city planning and authorities, as well as a large demand for PhDs within the area.

The program is directed to engineers interested in acting in this field-offering consultancy for construction companies, industrial enterprises, city halls and governmental housing organizations, etc. It is a trans disciplinary program that prepares engineers to work in projects dealing with the social aspects of projects.

The program is directed to engineers interested in acting in this field-offering consultancy for construction companies, industrial enterprises, city halls and governmental housing organizations, etc. It is an interdisciplinary program that prepares engineers to work in projects dealing with the social aspects of projects. The program is developed in modules: two modules per semester. The scores and the final project presentation online establish the final approval of a student. An

online chat with students provides teaching and guiding for the development of projects in a broader perspective. The MBA is taught almost using case studies—whereby students discuss real dilemmas faced by actual companies. The debates are online and last for three or four days. The professor opens up the debate by asking questions and the students then begin discussing the case.

As the target audience is spread over different continents, the cases are discussed in an Internet forum. Students enter the discussion at the time that is best for them. It can be early in the morning before going to work, sometimes in the evening or even late at night. Usually they will be involved for two or three hours every day. The choice of asynchronous learning mode of delivery is due to the fact that so participants access course materials on their own schedule and so it is more flexible [6]. However, there is the possibility of a present module for pertinent seminars and visits to companies and sites with the goal to enhance the acquisition of knowledge and experience in the field.

V. Program Framework

The two-year program (120 ECTS) consists of courses amounting to 90 ECTS, followed by a Degree project (30 ECTS). The system is compatible with ECTS credits. It is a Distance Learning study program and the language of instruction is Portuguese.

The number of possibilities is vast once the dynamic society in which man lives nowadays is more and more complex and mutant. It is an aspect that leads to the necessity of an investigation about an issue that is real and which solutions are feasible and in a short time. The most important aspect of such program might be the social analysis of a real problem, which demands a certain amount of efforts in the search of economically sustainable ways of solving it.

VI. Admission Requirements

The basic candidate requirement for admission is:

To have a bachelor's degree in civil engineering. However, the program encourages applicants from diverse backgrounds, including (but not limited to) engineering, environmental science, management and economy. Applicants may need to complete prerequisite courses. A faculty advisor will determine the specific requirements on an individual basis depending on the student's educational background and work experience [7].

VII. Candidate Profile

- Taste for related themes to the sciences of mathematics and physics and technological ones of civil engineering.
- Interest in solving problems in engineering in coastal and estuary environment principally the ones that involves the coast and constructions.
- Capability of questioning.
- Affinity and discipline for the activity of research [8].

VIII. Expected Outcomes of the Program Professional Profile

The engineer with an MBA in social engineering should present some characteristics as a professional. These expected characteristics are:

- Search constant updating and self-development through study and research, to propose innovations, identify and incorporate with criticism, new methods, techniques and technologies to their actions and respond to everyday situations and with unprecedented flexibility, creativity, resourcefulness as well as social and cultural.
- Taking professional attitude consistent with the principles governing the work area, working in multidisciplinary teams and relating appropriately with other professionals, clients and suppliers.
- Manage the career with initiative and in an entrepreneurial way, to provide services or organizations to conduct own business.
- Acting responsibly, committing to the principles of ethics, environmental sustainability, the preservation of health and social development, directing its activities to the values expressed in the professional ethos, which results in quality and commitment with work well done.

These characteristics are important because a social engineer will deal with the aspects of human life that are imperative for the future of young generations. The achievements have a huge impact on how life will develop in a region or community in the years to come. Specialists working in the field of social engineering can make a huge contribution to the overall engineering profession [9].

IX. Objectives of Program

The main objectives of this social engineering graduation program are:

- to prepare engineering researchers and professionals in administrative positions who work in areas related to policy to design and implement in national territory socio-economic systems and to develop the integrated theories and methods of these areas;
- to increase logical thinking, sense of social ethics, social assessment capability;
- to start thinking without any preconceived notions;
- to look for innovative problem solving.

X. Final Discussions

The definition of science, which states that it is a process of inquiry that involves questioning, hypothesizing, investigating, gathering evidence, and organizing data, testing, refining, predicting, explaining and communicating. So the development of science is a long process that requires some personal skills that can be fostered along the education period of the human being. The achievement of knowledge in order to make science respond to human needs results in technology that men use to

make life better. Due to the challenging characteristics of scientific knowledge application and development it is possible to say that it is in constant construction. This is what makes science and technology development so interesting and enticing for those professionals who are always seeking for new ways of working, meaning more effectively.

In this beginning of century the bachelor diploma is not enough to obtain success in a career. No doubt that a third degree diploma opens some doors. Therefore it means not only the possibility of earning more money but also to reach an upper status, socially speaking. However as the work market is more than ever extremely competitive and mutant life long learning is something that professionals should pursue.

Online learning is not for everyone at this point of human development stage. It is very difficult to juggle work, family and study. Plenty of self-discipline is necessary. However, the idea to study at any time any place that suits the students best is very appealing. Another aspect is that it gives an opportunity for bright students in different remote parts of the world to access a top-quality education program, which would otherwise be unavailable to them. Distance-learning students tend to apply what they have learnt immediately in their work, making their studies more practical.

Competitive modern marketplace demands rapid change and innovation, for which distance education programs can act as a catalyst. It is a lifelong learning environment once it provides the students the opportunity to receive equal education regardless of income status, area of residence, gender, race, age, or cost per student. The proposed program delivered by COPEC constitutes another opportunity for engineers to acquire knowledge in their fields of expertise to defeat social problems mainly faced by urban agglomerations derived by the global population growth.

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